**Remarks/Arguments**

Claims 25-69 are active in this application.

Claims 27, 31, 34, 35, 37, 38, 46-48, 50-53, 56-60, and 62 were withdrawn from consideration by the Examiner.

Claims 25, 26, 28-30, 32, 33, 36, 39-45, 49, 54, 55, 61, and 63-69 are rejected.

This action indicates that the Examiner has withdrawn the case from appeal to reopen prosecution to raise a new ground of rejection. Specifically, as outlined on page 2 of the Official Action, the Examiner alleges that the specification does not support the definition of the polymer being water-soluble in the specific range from 5 to 80° C. at a concentration of at least 10g/l. Applicants disagree. The water-soluble units are described on page 9 of the application. This definition of water-soluble units accompanied with the discussion on page 29 makes it quite clear that it is the polymer as a whole which has the defined solubility imparted by the water-soluble units. This would be clearly recognized by one in this field.

Moreover, support for the definition of water solubility in the entire range set forth in the claims as well as having no cloud point is found in at least those portions of the specification described immediately above. That these copolymers lead to transparent gels at any temperature, and thus also between 5°C and 80°C, whereas the polymers having an LCST may indeed lead to transparent gels at some specific temperatures but will lead to opaque cloudy gels at other temperatures, because as discussed on page 13, lines 13 to 17 "the cloud point is reflected by the opaeification of the solution or the loss of transparency".

Accordingly, withdrawal of the rejection under 35 USC 112, first paragraph is requested.

To the remaining rejections maintained from the previously issued final rejection.

There are fundamental differences between the claimed dispersion and specifically, the polymer defined in the claims, and the compositions and polymers described in the cited prior art references. Specifically, unlike the polymer defined in the claims, the polymers described in the cited prior art exhibited a cloud point (in other words, the polymers of the prior art are NOT water-soluble in a range of 5 to 80°C at a concentration of at least 10 g/l). The art relied upon by the Examiner in the rejections does not describe polymers as the ones selected in the claims, does not lead one to select such polymers, and, in fact, the Examiner has simply failed to provide factual basis to support the rejections.

It is well-settled law that the standard set forth in § 102(b) is that of novelty. Lack of novelty, i.e., anticipation requires strict identity between the claimed invention and that disclosed in the prior art reference. To anticipate a claim, a single prior art source must contain all of the essential limitations of the claim *Verdegaal Bros. v. Union Oil Co. of California* 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Put very simply, the claims specifically require that the polymer is water-soluble in a range of 5 to 80°C at a concentration of at least 10 g/l, which as one knows means that within the temperature range cited in the claims, the polymer does not exhibit a cloud point or LCST. This fact, which the Examiner has seemingly failed to appreciate, differentiates the claimed invention from the descriptions provided in the prior art.

The claimed invention is directed to a dispersion comprising

- at least one aqueous phase which contains a polymer and at least one oily phase;
- the polymer comprising
    - water-soluble units and
    - units with an LCST, the units with an LCST having in water a demixing temperature of from 5 to 40°C at a concentration of 1% by mass,

- the polymer formed of an oligomer or copolymer of water-soluble units wherein the polymer is water-soluble in a range of 5 to 80°C at a concentration of at least 10 g/l; and
- the polymer being present in the aqueous phase at a concentration such that the gel point of the aqueous phase is from 5 to 40°C, to ensure the stability of the dispersion when it is subjected to temperature variations in the range from 4 to 50°C

Why is this important and why does it distinguish over the cited prior art references?

As discussed in the specification on page 2, line 6- page 2, line 22, stability of cosmetic dispersions is very important because such dispersions are often stored and transported in a variety of temperatures sometimes at room temperature, sometimes at 4°C. Under these varied conditions the dispersion can demix (become heterogeneous) due to the loss in viscosity of the aqueous phase and would render the product unsatisfactory for consumer sale and use. This resultant heterogeneity of the dispersion is reflected by a phenomenon of sedimentation when the dispersed phase has a density greater than that of the continuous aqueous phase; this is the case for many aqueous suspensions of mineral particles. When the dispersed phase is less dense than the continuous aqueous phase, a phenomenon of creaming takes place, such as, for example, in the case of emulsions.

Further, as described in the specification on page 4, line 25 to page 5, line 31, the polymers include units with an LCST, which have, in water, a lower critical solution temperature. These LCST units have a modified solubility in water beyond a certain temperature. They are units having a heat-induced demixing temperature (or cloud point) defining their region of water solubility. The minimum demixing temperature obtained as a function of the polymer concentration is known as the "LCST" (Lower Critical Solution

Temperature). For each polymer concentration, a heat-induced demixing temperature is observed; it is higher than the LCST, which is the minimum point of the curve. Below this temperature, the polymer is water-soluble, and above this temperature, the polymer loses its water solubility. Thus, the polymers containing the LCST units in the manner as claimed have water-gelling properties as a result of temperature changes.

According to the invention, a polymer is selected whose units with an LCST have a demixing temperature of from 5 to 40 °C at a concentration of 1% by mass, so as to obtain the gelation of an aqueous phase containing this polymer in the desired range. Furthermore, the polymer concentration used is sufficient to allow interactions between units with an LCST borne by different macromolecules, and to obtain this gelation of the aqueous phase, thus making it possible to ensure the stability of the dispersion.

In fact, the specification also presented data demonstrating the advantageous effects of selecting the types of polymers claimed as opposed to other polymers.

Example 1 (page 32, line 20 through page 34, line 14) prepared an oil-in-water emulsion containing a polymer identified as "polymer 2." Polymer 2 is described in Table 1 on page 27 and is composed of (1) a water-soluble backbone containing polyacrylic acid; and (2) LCST units as grafts—poly-N-isopropyl-acrylamide in a proportion of 49% based on the final weight of the polymer; achieving a 0.9% degree of grafting (mol %). The emulsion prepared in Example 1 was subjected to temperature changes over the range of 4 to 45°C and the macroscopic appearance and thus the stability of the composition was monitored. As concluded in the specification, the polymer improves the stability of the emulsion at 45°C while maintaining a low viscosity at 20°C.

As a comparison, the specification described another oil-in-water emulsion containing another polymer (crosslinked poly(2-acrylamido-2-methylpropane sulphonic acid), see Comparative Example on page 34, line 16 through page 36, line 5. Similar analyses were

performed for this composition. As concluded in the specification, while the viscosity and stability of the comparative emulsion had similar properties at 4°C, the emulsion destabilized at higher temperatures (45°C) where the composition containing polymer 2 did not destabilize.

Therefore, upon review of the facts of this case, it should be apparent that the claimed invention is not described by the cited art with sufficient specificity as to constitute anticipation or obviousness under U.S. patent law and therefore the rejections should be withdrawn.

**Merchant**

Merchant's goal is to provide "novel demulsifier formulations and processes for dewatering and/or desalting conventional whole heavy petroleum crudes, heavy petroleum crude fractions, residue, fuel oils and refinery hydrocarbon fractions." (col. 3, lines 14-21) This is an entirely different field and purpose when compared to the invention and the problems it solves (maintaining stability and viscosity of a dispersion over a wide-range of temperatures). Therefore, the general descriptions provided in the Merchant patent simply would not lead one to select the types of polymers claimed. Moreover, Merchant does not describe, with any specificity, the polymer contained in the claimed dispersion. In fact, assessment of the polymers Merchant would lead one to different polymers.

The polymers disclosed in Merchant do not contain an oligomer or copolymer of water-soluble units as claimed (see the maleic anhydride grafted to an alkyl phenol formaldehyde resin in col. 6, lines 41-49), and the polymers disclosed in Merchant do not contain LCST units, which are one of the limitations that defines the claims over this reference—see the preferred p-nonyl phenyl formaldehyde resin having 10 moles of ethylene oxide in the Examples of Merchant (see col. 10, lines 42-45 and col. 11, lines 29-30).

This formaldehyde resin with 10 moles of ethylene oxide contained in the polymers are not LCST units as has been clearly shown in the Malcom and Rowlinson publication, now of record. What becomes clear from this publication is that the Merchant polymers described are those that have no LCST. In this Malcolm publication, Figure 6 (Page 926) shows the phase diagrams for polyethyelene oxide (indicated in squares and crosses) in which above the curve there exists two phases, below the curve there exists one phase, and the lowest point of the curve defines the LCST. Therefore, this Figure shows that as the molecular weight of the polyethylene oxide gets smaller, the two phase domain also gets smaller. Also illustrated is that for a POE of 3000, the two phase domain is indicted as the oval in the Figure. Taken together then, 10 units of polyethylene oxide as is the case in Merchant would only exhibit 1 phase, i.e., no LCST.

In maintaining this rejection, the Office states that the teachings of the reference are not as limited to the examples illustrated in the above-discussion because Merchant describes other demulsifiers in col. 5, including oxyalkylated amines, glycol resin esters, oxyalkylated polyols and oxyalkylated alkyl-phenol formaldehyde resins. The point is missed. The point here is that while the Merchant polymers may be water-soluble (col. 5, line 34), they do not contain LCST units as defined in the claims of this application, as shown by the uncontested evidence, of record and discussed above. Further, the species specifically exemplified by Merchant are exemplary of Merchant's emulsifiers and are simply not the same polymers as defined in the claimed method and that absent such a description, Merchant does not provide the requisite disclosure to select monomers of water-soluble and LCST units and arrange them in the manner that would be the same as the polymer defined in the claimed dispersion. This becomes even more apparent when recognizing that the teachings of Merchant would lead one to select polymers optimized for the dewatering and/or desalting of hydrocarbon oil as opposed to maintaining stability and viscosity of, for example, a cosmetic dispersion.

Using the language from MPEP §2131.02, one of ordinary skill in the art would not be able to "at once envisage" the polymers set forth in the claimed dispersion. In view of this, the claims cannot be anticipated by the Merchant disclosure.

Moreover, Merchant does not describe the arrangement set forth in dependent Claim 29, in which the polymer is either

(1) water-soluble units alternating with units with an LCST; or

(2) a graft polymer whose backbone is formed from water-soluble units and bears LCST grafts.

In fact, the Office has failed to provide any reasons why this claim has been rejected in view of Merchant.

Moreover, Merchant does not describe or provide any suggestion for providing the arrangement in Claim 32, wherein water-soluble units have a molar mass ranging from 1000 g/mol to 5 000 000 g/mol when they constitute the water-soluble backbone of a grafted polymer, or a molar mass ranging from 500 g/mol to 100 000 g/mol when they constitute a block of a multiblock polymer or when they constitute the grafts of a grafted polymer. In fact, the Office has failed to provide any reasons why this claim has been rejected in view of Merchant.

Moreover, Merchant does not describe or provide any suggestion for providing the arrangement in Claim 40, in which the demixing temperature of the units with an LCST is from 10 to 35°C, for a concentration in water of 1% by mass of the units with an LCST. In fact, the Office has failed to provide any reasons why this claim has been rejected in view of Merchant.

Moreover, Merchant does not describe or provide any suggestion for providing the arrangement in Claim 45, which is in the form of a cosmetic make-up or care composition. In fact, the Office has failed to provide any reasons why this claim has been rejected in view of Merchant. Moreover, this is apparent from the fact that Merchants compositions are in a form for dewatering and/or desalting of hydrocarbon oil.

Withdrawal of the rejection in view of Merchant is requested.

Koerner

Koerner describes an alkyl polyether at the top of col. 8, which polymer has a cloud point, i.e., the polymer exhibits an LCST, at a specific temperature and concentration (col. 8, lines 1-6). This polymer, however, is different from the polymer defined in the claimed dispersion where the polymer does not exhibit an LCST. As discussed on page 5, lines 16-31 of the present application, the polymer as a whole does not exhibit an LCST and permits the formulation of transparent compositions while the LCST units facilitate gelation and stability of the dispersion. This is apparent from the limitations provided in Claim 25: "wherein the polymer is water-soluble in a range of 5 to 80°C at a concentration of at least 10 g/l."

Moreover, the polymers described elsewhere in Koerner, e.g., columns 5 and 6, also have a cloud point (see col. 6, lines 24-29) and thus are not the same as the polymer defined in the claimed dispersion.

The rejection based on Koerner was maintained, at least in part, because "the particular polymer of example 8 has a cloud point at a higher concentration that the concentration recited in the claims." (Page 5 of the Official Action of April 5, 2006) However, the polymers used in the claimed dispersions do not have a cloud point at a concentration of at least 10g/l or LCST unlike those in Koerner. The Office further supports

the rejection because the abstract of Koerner states that the emulsifier is water-soluble. Certainly the Abstract states this, but a polymer can be water-soluble at a certain concentration and temperature and still have a cloud point within another temperature (see col. 6, lines 24-28 of Koerner "which may be dissolved in water in any ratio and which had a cloud point . . ."). Again, what is missing from Koerner is a description of polymers that meets the claimed limitation of water-solubility in a range of 5 to 80°C at a concentration of at least 10 g/l.

Withdrawal of the rejection in view of Koerner is requested.

**Fogel**

Fogel in col. 2 describes an alkoylate ester of a specific formula where $R_2$ can be either (a) or (b) and x is from 1 to 10 (see lines 53-62). Polyoxypropylene groups, e.g., when x is 10, have a molecular weight of 580 g/mol and as shown on the attached technical sheet have a demixing temperature, i.e., cloud point, at a 1% concentration of 65°C (see P600E) (Dow Corning Technical Sheet: polypropylene glycol). Furthermore, where x is less than 10, the demixing temperature, i.e., cloud point, is much greater than 65°C (see, e.g., P400E). Thus, it is quite clear that the polymers of Fogel have a cloud point, which clearly makes those polymers different from the polymers used in the claimed dispersion.

In maintaining this rejection previously (Office Action of July 15, 2005), the Office states: "applicant appears to be ignoring the polyoxyethylene portions of the water-soluble polymers, i.e., wherein y is from 1 to 20." Applicants did not ignore this disclosure in Fogel and moreover, is not particularly relevant to the claimed invention. These polyoxyethylene portions are the water-soluble portion of the alkoxylate esters. Said another way, the $-(OCH_2CH_2)$ is the water-soluble portion and $(R_2)_x$ is the LCST portion of the alkoxylate ester.

Specifically, it has already been explained that alkoylate ester of a specific formula where $R_2$ can be either (a) or (b) and x is from 1 to 10 (see col. 2, lines 53-62) are those having cloud points within the range that the claimed polymers are to be water-soluble. The technical basis for this distinction is reiterated below.

Polyoxypropylene groups, e.g., when x is 10, have a molecular weight of 580 g/mol and have a demixing temperature, i.e., cloud point, at a 1% concentration of 65°C (see P600E) (Dow Corning Technical Sheet: polypropylene glycol—of record). Furthermore, where x is less than 10, the demixing temperature, i.e., cloud point, is much greater than 65°C (see, e.g., P400E). Therefore, the polymers in Fogel are unquestionably different from the polymer defined in the claims.

More recently, in the Office Action of April 5, 2006, the Office cites Fogel at col. 4, lines 46-50 concluding that "they would be water-soluble in the range claimed by applicant." (page 5 of the Office Action). This portion of Fogel merely says such would be preferable but by no means provides suitable evidence to contradict the evidence and explanation that Applicants have provided which shows, quite clearly, that the polymers in Fogel simply are not the same as those claimed.

Moreover, as cited by the Office on page 5 of the April 5, 2006 Action, the cloud point of the alkoylate esters is preferably below $0^0$C. How is this a teaching for polymer being water-soluble in the range of 5 to 80°C as claimed?

Even more compelling is the fact that unlike the present claims which include a polymer, the alkxylate esters of Fogel are small molecules with low molecular weights are simply are not polymers (see also the compounds in col. 8, lines 40-45, col. 9, lines 33-42, col. 10, lines 14-24, col. 11, lnies 1-7, col. 11, lines 51-60, col. 12, lines 40-49, col. 13, lines 23-30 and col. 14, lines 9-19 of Fogel)

Withdrawl of the rejection in view of Fogel is requested.

Maroy publications

The Maroy publications are acknowledged on page 4, lines 23 of the present specification. The Maroy publications describe a polymer with water-soluble groups and LCST groups (page 2, lines 26-30 of EP '814). Maroy also describes that the groups with LCST can be copolymerized with the water-soluble groups or grafted onto a hydrosoluble skeleton (page 2, lines 34-44 of EP '814).

Maroy does not describe a polymer containing LCST units having a demixing temperature of 5 to 40°C at 1% by mass in water in the claimed method. In fact, the LCST units described in the Maroy publications do NOT have, in water, a demixing temperature of from of 5 to 40°C at 1% by mass in water. Specifically, on page 2, lines 53-56 and page 3, lines 2-3 of EP '814 and col. 2, line 54 to col. 3, line 4, Maroy describes that the LCST units selected from polyethyleneglycol (POE), polyoxypropylene (POP) or polyoxide of ethylene and propylene (POEP). Furthermore, Examples 1.1, 1.2, 1.3, and 1.4 of EP '814 (Maroy) on pages 3-4, all describe polymers with POE5 as the LCST units, which is polyethyleneglycol with a molecular weight of 5000 g/mol. However, these polymers have a demixing temperature above 100°C at a concentration of 1 % by mass (see page 5, line 41, page 6, lines 37-39, and page 6, lines 57-59 of EP '814). Therefore, these polymers cannot be the same as the polymer defined in the claimed dispersion (having a demixing temperature of 5 to 40°C at 1% by mass in water).

In Example 2.3 (page 7) of EP '814 (Maroy), the polymer contains POP of a molecular weight of 600 as the LCST unit. However, unlike the polymer in the claimed dispersion, this polymer of Maroy has a demixing temperature of 48°C at a concentration of 1 % by mass. In Example 2.5 (pages 7-8) of EP '814 (Maroy), the polymer contains a POEP polymer with a molecular weight of approximately 1100. However, unlike the polymer in the

claimed dispersion, this polymer has a demixing temperature above 60°C (see Figure 3 of EP '814).

In the Examples of EP '649, Maroy describes the same example as 1.2 from EP '814 (see the reference to French application 9210224, which is the priority application of EP '814 in col. 6, line 40 and lines 54-56) and Examples 4 and 5 which include POE with a molecular weight of about 5000. For the same reasons as discussed above concerning EP '814, these specifically described polymers have a demixing temperature above 60°C and are therefore NOT the same as the polymer set forth in the claimed dispersion.

Having provided evidence that the polymers described by the Maroy publications do not necessarily, each and every time, have the properties of the polymer defined in the claimed dispersion, the rejections based on Maroy '814 and '649 should be withdrawn.

In maintaining this rejection, the Office takes the position that "the prior art teachings are not limited to the species of the examples. The LCST groups, as identified in applicant's specification, are generically taught by Maroy." Whether, generically, various monomers are described that could be combined is not the correct standard for anticipation. The prior art must disclose with sufficient specificity the claimed invention in a manner that would allow one of ordinary skill in the art to "at once envisage" the polymers set forth in the claimed dispersion. The Maroy publications do not do that. As discussed above in great detail, in fact, if one followed the direction that the Maroy publications provides, it would lead to polymers having different properties than the ones defined in the claims.

As for the alternative obviousness rejection raised in view of these two publication, there must be some suggestion in the prior art to achieve the claimed invention (as opposed to using the claims as a guide to reconstruct the prior art, as the Office has done here). There is simply nothing in Maroy which would lead one to select the polymers in the claims nor that in so selecting one would be able to maintain viscosity and stability of a dispersion over a

wide temperature range. This is even more apparent when considering the entirety of the Maroy teachings (as is required). While the '649 Maroy publication makes passing mention to cosmetics, it is abundantly clear that both of the publications are directed to designing polymers particular useful in the oil industry (see EP '814 at page 2, lines 8-11 and EP '649, page 2, col. 1, lines 21-29).

Withdrawal of the rejections in view of the Maroy publications is requested.

Claim 49 is rejected because "it is unclear if applicant is claiming a block polymer or graft polymer." (Page 3 of the Official Action).

The essential inquiry pertaining to the requirement under 35 U.S.C. § 112, second paragraph is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

(A) The content of the particular application disclosure;

(B) The teachings of the prior art; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. See MPEP § 2173.02

The relevant section of Claim 49 as found in Appendix I is reproduced below for immediate reference:

> wherein the polymer is in the form of a block polymer in the form of *a grafted* polymer whose backbone is formed from water-soluble units and *bears grafts consisting of units with an LCST* and which is partially crosslinked.

As explained previously, and as apparent from the plain language of Claim 49, the polymer is a block polymer with water-soluble units in the backbone having *grafts of LCST units*. How could this be any clearer? Applicants submit that one in this field having

familiarity with the knowledge in the filed and the conventional terminology used to describe polymers, would understand what this claim means.

Withdrawal of the rejection under 35 USC 112, second paragraph is requested.

A Notice of Allowance is requested.

Respectfully submitted,

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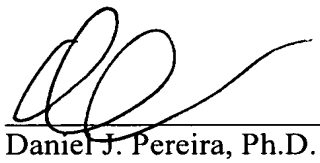
Norman F. Oblon



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